REF 5

19. The Patent Office of Japan (JP)
11. Patent Application for Public Exhibition, Ref.5

12. Patent Report (A), 62-155846

51. Int. Cl.4 Identification Symbol Office Reference Number
A 61 F 2/44 6779-4C
43. Public Exhibition July 10, 1987 (Showa 62)

Examination Request Not Requested Number of Inventions 1 (3 pages)

54. Name of Invention SPINAL BLOCK FOR THE LUMBAR
21. Patent Application Showa 60-299476
22. Application Date December 27, 1985 (Showa 60)

72. Inventor TSUJI, Haruo 2630 Sugitani, Toyama City
71. Applicant KYOCERA 5-22 Kita Inoue-cho, Higashino, Yamashina-ku, Kyoto City

(p.1, column 1)
Detailed Statement

1. Name of Invention
Lumbar Spinal Block

2. Area covered by the Patent Request

(1) A lumbar spinal block which preserves the space between the lumbar vertebrae spine, forms a pillar-shaped body, and at the top and bottom surfaces of the pillar-shaped body are multiple protrusions.
(2) A lumbar spinal block mentioned in paragraph 1 of Area covered by the Patent Request, where the above pillar-shaped bodies are made of a form of ceramic, such as alumina and apatite.

3. Detailed Explanation of the Invention

(Industrial Usage Areas)

This invention involves a spinal block used to preserve the space between the vertebral bodies by inserting in between the spines, when securing in between the vertebral bodies.

(Current Methods and Their Problems)

For the many backache-related conditions that involve the degeneration of lumbar intervertebral disc deterioration, such as lumbar disc herniation, lumbar stiffness, spinal cord separation (*separation of the vertebral column???*), and pathological deterioration of the intervertebral disc,..

(p.1, column 2)

...inserting one's own bones, such as the ileum has been the procedure used.

However, when the front vertebral body space is secured with one's own bones, separation can occur between the inserted transplanted bone and between the vertebral bodies, especially when standing up, as well as the problem of stress from off-centering to the front and back causing condensation of the transplanted bone to take as long as several months.

(Methods to Resolve the Problem Points)

In order to prevent separation of the transplanted bone after the above vertebral body securing process, add small incisions to the back side at the same time, and insert additional securing material that uses ceramic as raw material can be eternally buried in between the lumbar protrusions at the applicable levels.

(Implementation Sample)

Here, the invention and an application sample will be presented with diagrams.

Diagram 1, as one implementation example, shows a diagonal view of the lumbar spinal block 1. This spinal block 1 is from such ceramic as alumina, zircon, and apatite that is not harmful to the body, diameter R•8 ~ 15 mm, height h•8 ~ 14 mm, roughly pillar-shaped.

(p.2)

Also, on the top and bottom surfaces 2 and 3 of the lumbar block 1 there is formed a united protrusion 2(a) that is each one square, and along the side are at least one flat surface 4 for better handling in case of insertion between the lumbar protrusions. This flat surface 4 has a hole 5 at the center. Furthermore, this hole 5 can go all the way through, and during operations, when inserting pliers or other tools where the tips intervene, it will prevent dropping or moving, and will allow for a secure hold.

Also, at the top and bottom surfaces of lumbar block 1, in place of a square shaped protrusion 2(a), there can be a round protrusion 2(b), or a triangular protrusion 2(c), as shown in Diagram 2 (a) (b). Also these differently shaped protrusions 2(a) and 2(b) and 2(c) can combine, and the pinnacle can be sharp and protruding, or the lumbar block 1 can be pillar-shaped and rectangular.

Next will be an explanation of how to use the above mentioned lumbar block 1 invention, using diagrams.

In Diagram 3, the E1 and E2 are vertebral bodies, H is the intervertebral disc, and the lumbar protrusions K1 and K2 which are each continuous with vertebral bodies E1 and E2. After the intervertebral disc is removed, the transplant bone B removed from another part of the body will be transplanted in the space between vertebral bodies E1 and E2. In this case, lumbar block 1 is inserted between lumbar protrusions K1 and K2, which are continuous with vertebral bodies E1 and E2.

In this case, the space between lumbar protrusions K1 and K2 are operated on prior so that the shape will be perfect for securing.

Furthermore, when inserting the lumbar block 1, because it will be inserted into something that has been expanded by an "expander," the transplant bone will be secured very tightly between vertebral bodies E1 and E2. Even the lumbar block 1 that has been inserted will secure firmly, and because of protrusions 2(a), 2(b), and 2(c) formed on the top and bottom surfaces of the lumbar block 1, items falling and moving between lumbar protrusions K1 and K2 should be prevented.

We have seen an example of vertebral bodies E1 and E2 using transplanted bone B extracted from another part of the body of the same person. However, ceramic items such as alumina and apatite, and metal items such as titanium and tantalum can also be substituded for transplantation bone B.

Also, the size of lumbar block A will differ depending on the size of the vertebral bodies and bones of the applicable part, and decisions should be based on their measurements, but when doing plastic surgery between lumbar protrusions K1 and K2, it is enough to cut at roughly the designated spot, so diameter R should be 8 ~ 15 mm, height 8 ~ 14 mm.

When comparing the average clinical results of when the above lumbar block invention was used to that of the traditional surgery method without the invention, the following results in Table 1 were obtained:

CHART 1

Example of intervertebral disc hernia

Recovery rate	for the traditional surgery	when lumbar block invention was used
walking upright	3~4 weeks	2 weeks
discharged	6 weeks	3 weeks
light work	4 months	2 months
heavy work (back to work)	6 months	3 months

Furthermore, this lumbar block invention can be applied not only to the above intervertebral disc hernia, but broadly to other forms of surgery for vertebral body exchange, repair, etc.

(Effectiveness of Invention)

As shown above, inserting and securing this invention between the lumbar protrusions ensures secure maintenance of one's own bones, transplantation bones such as artificial bones, and vertebral body spacers. Also, recovery after surgery is shortened, thus contributes greatly to the welfare of mankind.

4. Simple Explanation of the Diagrams

Diagram 1 shows one implementation sample of this invention, a lumbar block from a diagonal view. Diagram 2 (a) (b) are each from the top of the lumbar block, as implementation samples of other inventions. Diagram 3 is a side view of the condition with this lumbar block invention implanted.

1. lumbar block 2a, 2b, 2c, protrusion
5. hole E1, E2, vertebral body
B. transplantation bone K1, K2, lumbar protrusion

Applicant: KYOCERA